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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Y. SHIOMI, et al.

Serial No: 10/509,228

Filed: September 24, 2004

Title: PROCESS FOR PREPARING HETEROCYCLIC ALDEHYDE

Group: 1625

Examiner: Binto M. ROBINSON

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DECLARATION UNDER 37 C.F.R. §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

We, Yasuhiro Shiomi, Osamu Uno, Akio Ohta and Takeshi Sunakami, declare and state as follows:

1. We are the inventors of the above-identified application Serial No. 10/509,228.

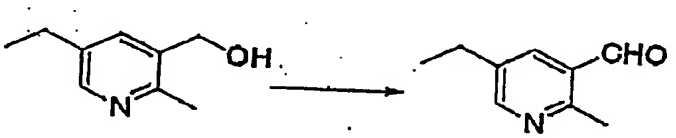
2. Claims 1-4 in application Serial No. 10/509,228 were rejected in the Office Action mailed October 20, 2006 under 35 U.S.C. §102(b) as being anticipated by Inokuchi, et al. (J. of Org. Chem.), and were further rejected under 35 U.S.C. §102(b) as being anticipated by Inokuchi, et al. (Bull. Chem. Soc.).

3. We have reviewed the cited references to Inokuchi, et al. (J. of Org. Chem.) and Inokuchi, et al. (Bull. Chem. Soc.) and traverse the

aforementioned rejections for the reasons set forth below and respectfully submit that the claims in application Serial No. 10/509,228, as amended by the Amendment filed January 22, 2007, claims 1 and 7, patentably define over the cited references, 35 U.S.C. §102 and 103.

4. The present invention of our application Serial No. 10/509,228 can provide a process for preparing pyridinecarbaldehyde by oxidizing a pyridinemethanol with high selectivity and high yield in the case that a 2,2,6,6-tetramethylpiperidine-1-oxyl derivative having at least four 2,2,6,6-tetramethylpiperidine-1-oxyl-4-yl groups (hereinafter referred to as DERIVATIVE-A) is used instead of 2,2,6,6-tetramethylpiperidine-1-oxyl. As described in lines 13 to 26, page 10 of the specification of application Serial No. 10/509,228, it is important to use a DERIVATIVE-A in the oxidation reaction of pyridinemethanol. By conducting oxidization reaction using such DERIVATIVE-A, side reactions can be inhibited and heterocyclic aldehyde can be prepared selectively with high yield. This effect is apparent from a comparison with Examples and Comparative Examples of the specification of application Serial No. 10/509,228. Specifically, Example 1 of the specification, see page 36, (the oxidation reaction of 3-pyridinemethanol when using PIPO), 3-pyridinecarbaldehyde is produced with a yield of 90.1% and nicotinic acid (byproduct) was produced with a yield of 3.4%, and in Comparative Example 1, see page 39, (the oxidization reaction of 3-pyridinemethanol when using 2,2,6,6-tetramethylpiperidine-1-oxyl), 3-pyridinecarbaldehyde is produced with a yield of only 61.2% and nicotinic acid is produced with a yield of 9.2%.

5. The *J. Org. Chem.* 1990, 55, 462-466 (hereinafter referred to as D1) discloses an oxidation reaction of alcohols leading to the corresponding aldehydes in the presence of 4-(benzoyloxy)-2, 2, 6, 6-tetramethypipertidine-1-oxyl and $NaBrO_2$ (co-oxidant). Also, D1 discloses that the following oxidation reaction (1) is conducted in the presence of $NaBrO_2$ and 4-(benzoyloxy)-2,2,6,6-tetramethylpipertidine-1-oxyl (Table II entry 12).



(1)

However, D1 neither describes nor suggests DERIVATIVE-A.

6. The *Bull. Chem. Soc. Jpn.*, 64, 796-800 (1991) (hereinafter, referred to as D2) merely discloses that the oxidation of aromatic alcohols is conducted by using the combination of N-oxyl compounds such as 4-(benzoyloxy)-2,2,6,6-tetramethylpipertidine-1-oxyl (as an oxidant) and tetraalkylammonium tribromides such as Bu_4NBr_3 (as a co-oxidant) instead of using the combination of 4-(benzoyloxy)-2,2,6,6-tetramethylpipertidine-1-oxyl and $NaBr0_2$ (lines 18 to 30, left column, page 799). However, in D2, DERIVATIVE-A is neither described nor suggested.

7. Our invention as recited in claim 1 as amended in application Serial No. 10/509,228 differs from D1 and D2 in using a 2,2,6,6-tetramethylpiperidine-1-oxyl derivative having at least four 2,2,6,6-tetramethylpiperidine-1-oxyl-4-yl groups. Also, D1 and D2 neither describe nor suggest the above excellent effects of the present invention and a 2,2,6,6-tetramethylpiperidine-1-oxyl derivative having at least four 2,2,6,6-

tetramethylpiperidine-1-oxyl-4-yl groups. Therefore, our invention, which exhibits the excellent effect by using a 2,2,6,6-tetramethylpiperidine-1-oxyl derivative having at least four 2,2,6,6-tetramethylpiperidine-1-oxyl-4-yl groups, cannot be reached from D1 and D2, 35 U.S.C. §102(b)/103. New claim 7 in application Serial No. 10/509,228 is also believed to patentably define over the cited references.

The undersigned declarants declare further that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Executed this 6th day of April, 2007.

Yasuhiro Shiomi

Yasuhiro Shiomi

Osamu Uno

Osamu Uno

Akio Ohta

Akio Ohta

Takeshi Sunakami

Takeshi Sunakami